



# SAN BERNARDINO COUNTY STORMWATER PROGRAM

## **MODEL WATER QUALITY MANAGEMENT PLAN GUIDANCE**

DECEMBER 2003

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# **Executive Summary**

## **Model Water Quality Management Plan Guidance**

Model Water Quality Management Plan (WQMP) Guidance has been developed to comply with provisions of the Santa Ana Regional Water Quality Control Board (RWQCB) Order Number R8-2002-0012, NPDES Permit No. CAS618036 (Permit). The Permit requires post-construction Best Management Practices (BMPs) on certain new development and significant redevelopment projects. Post-construction BMPs are required for both private and public agency development and redevelopment projects.

The purpose of the model WQMP is to guide the Permittees that have land-use planning and development authority in the development and implementation of a program to minimize the detrimental effects of urbanization on the beneficial uses of receiving waters, including effects caused by increased pollutant loads and changes in hydrology. These effects may be minimized through programs that require the implementation of site design and source control BMPs, and/or either on-site structural treatment control BMPs or participation in watershed-based structural treatment control BMPs. An effective and acceptable program will require that sponsors of covered development and redevelopment projects develop and implement a project-specific Water Quality Management Plan (WQMP) that meets the following requirements:

- The pollutants in post-development runoff shall be reduced using controls that utilize best available technology (BAT) and best conventional technology (BCT).
- The discharge of any listed pollutant to an impaired water body on the 303(d) list shall not cause or contribute to an exceedance of receiving water quality objectives.

This guidance document provides a WQMP framework that local agencies can adopt. Local agencies can then require sponsors of covered development and redevelopment projects to use the framework to develop a WQMP to be implemented during the project planning, design, approval, permitting, construction, acceptance, and occupancy phases. This guidance, once approved by the Executive Officer of the Santa Ana Regional Water Quality Control Board, represents the standard for Permit compliance by local agencies. While the agencies are encouraged to adapt the model WQMP to meet the specific circumstances in their communities, it must be noted that adoption and implementation of significantly different requirements, and specifically, less stringent requirements than contained in the model WQMP, could result in an agency being in noncompliance with the Permit and therefore subject to regulatory enforcement actions and third-party suits as provided under the federal Clean Water Act or the state Porter-Cologne Water Quality Act.

A template (Attachment A) has been developed to assist with completing a WQMP for submittal. The template serves as a tool for project applicants, and provides for the submittal of thorough and consistent project information for agency WQMP approval.

The WQMP development and approval process requires specific actions and roles for participants. Participants and roles include:

**Principal Permittee (San Bernardino County Flood Control District):** The Principal Permittee is responsible for overseeing the development and implementation of the area-wide storm water program, including development and maintenance of a model WQMP for local agency new development and significant redevelopment programs.

**Permittees (The Co-Permittees, referred to herein as Agencies):** Each Agency is individually responsible for compliance with the Permit. Each Agency with land use planning and development authority (The San Bernardino County Flood Control District is the only Permittee without land use planning and development authority) is responsible for implementing a program in their jurisdiction that requires the development and implementation of a WQMP for all covered projects, reviewing and approving WQMPs submitted by project sponsors, and verifying that WQMPs are implemented in conjunction with covered projects. Local agencies are also required to periodically update the WQMP guidance to reflect changes in the 303(d) list. Local agencies may elect to require WQMPs for projects that are not specifically required by the Permit to be covered under a WQMP.

**Developers (Private and Public Agency):** Private and public agency developers of projects that require WQMPs are responsible for developing WQMPs in accordance with requirements adopted by the local Agency, submitting the WQMP to the local Agency for approval, implementing the WQMP until a change in ownership occurs, and transferring WQMP implementation responsibilities to the new owner.

# Section 1

## WQMP Process

### 1.1 Introduction

Santa Ana Regional Water Quality Control Board (RWQCB) Order Number R8-2002-0012, NPDES Permit No. CAS618036 (Permit) requires post-construction Best Management Practices (BMPs) on certain new development and significant redevelopment projects. Post-construction BMPs are required for both private and public agency development and redevelopment.

This Water Quality Management Plan (WQMP) guidance document provides the framework to be followed by developers for the development and implementation of a WQMP to minimize the detrimental effects of development or redevelopment projects on the beneficial uses of receiving waters, including effects caused by increased pollutant loads and changes in hydrology. These effects may be minimized through the implementation of site design and source control BMPs, and/or either on-site structural treatment control BMPs or participation in watershed-based structural treatment control BMPs. An effective and acceptable WQMP will meet the following requirements:

- The pollutants in post-development runoff shall be reduced using controls that utilize best available technology (BAT) and best conventional technology (BCT).
- The discharge of any listed pollutant to an impaired water body on the 303(d) list shall not cause or contribute to an exceedance of receiving water quality objectives.

Attachment A presents a template for project applicants to follow during development of a WQMP for submittal to the Agency for approval. Use of the template will provide for consistent formatting and the minimum level of documentation for approval by the Agency. However, the Agency may require additional documentation prior to project approval.

### 1.2 Projects Requiring a WQMP

The Permit identifies the types of development and redevelopment projects that must develop, submit, and implement a WQMP. Table 1-1 lists these types of projects. In addition, the Agency may require development of a WQMP for other types of projects.

<b>Table 1-1 WQMP-Required Projects</b>	
1.	All significant re-development projects. Significant re-development is defined as the addition or creation of 5,000 or more square feet of impervious surface on an already developed site. This includes, but is not limited to, additional buildings and/or structures, extension of existing footprint of a building, construction of parking lots, etc. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMPs, the design standards apply only to the addition, and not the entire development. When the redevelopment results in an increase of more than fifty percent of the impervious surfaces, then a WQMP is required for the entire development (new and existing).
2.	Home subdivisions of 10 units or more. This includes single family residences, multi-family residence, condominiums, apartments, etc.
3.	Industrial/commercial developments of 100,000 square feet or more. Commercial developments include non-residential developments such as hospitals, educational institutions, recreational facilities, mini-malls, hotels, office buildings, warehouses, and light industrial facilities.
4.	Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532- 7534, 7536-7539).
5.	Restaurants where the land area of development is 5,000 square feet or more.
6.	Hillside developments of 10,000 square feet or more which are located on areas with known erosive soil conditions or where the natural slope is twenty-five percent or more.
7.	Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas such as areas designated in the Ocean Plan as areas of special biological significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.
8.	Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary storage of motor vehicles.
Notes: 1. A subdivision of land may require a WQMP. 2. For Standard Industrial Classification (SIC) codes, see: <a href="http://www.osha.gov/oshstats/sicser.html">www.osha.gov/oshstats/sicser.html</a> 3. For the current list of 303(d) impaired waterbodies, contact the local Regional Water Quality Control Board. Table B-1 in Attachment B contains a reference list based upon the 2002 303(d) list.	

## 1.3 WQMP Development Approach

Figure 1-1 illustrates the overall approach for developing a WQMP for new development and redevelopment projects.

<b>Figure 1-1 WQMP Development Approach</b>	
<b>STEP</b>	<b>APPROACH</b>
1	Determine if WQMP is Required
2	Determine Pollutants of Concern and Hydrologic Conditions of Concern
3	Incorporate Source Control BMPs
4	Incorporate Site Design BMPs
5*	Incorporate Treatment Control BMPs
6*	Determine Operation and Maintenance Requirements and Responsible Party
7*	Determine Funding Source for Operations and Maintenance and Responsible Party
8	Complete WQMP Template with Information from Steps 1 Thru 7
9	Submit WQMP for Approval
* Step not necessary if the individual project is part of a regional-based water quality control program	

To assist in determining if a WQMP is required for a project, Pages A-1, A-2, and A-3 of the WQMP Template (Attachment A) shall be completed and submitted to the Agency for review and approval. If the Agency determines that a WQMP is required, the WQMP will need to be developed, submitted, and approved prior to the Agency issuing grading, building, or occupancy permits.

Failure to develop or submit a WQMP for covered projects will result in denial of grading, building, and occupancy permits. Failure to implement a WQMP in conjunction with the project will result in denial of occupancy permits or approvals. Failure to implement a WQMP after construction of the project may result in enforcement actions by the Agency and the Agency may report the non-compliance of the project to the Regional Water Quality Control Board for additional enforcement actions.

## Section 2

# WQMP Contents

This section summarizes the information to be included in a WQMP.

### 2.1 Project Information and Certification

The following general information is required:

- The name of the owner of the project and the site address.
- The tract or discretionary permit number(s), condition number(s), and any acquired waste discharge identification numbers (WDIDs).
- A detailed project description (type, size, homeowners association or property owners association information) with a location map and site plan identifying storm drain facilities and structures, structural BMPs, stormwater flow (drainage), and the receiving water. The location and site plan may be shown on the same map.
- A site description identifying the watershed(s) that the project lies within and any pre-existing water quality problems that have been identified.
- A signed statement (with date) certifying that the provisions of the WQMP have been accepted by the applicant and that the applicant will have the plan carried out by future successors (transferability statement).

### 2.2 Watershed Impact of Project

Identify the expected pollutants of concern and hydrologic conditions of concern associated with the project that will be mitigated through the implementation of BMPs identified in the WQMP.

#### 2.2.1 Identify Pollutants of Concern

Table 2-1 provides guidance for determining expected pollutants of concern and lists pollutants that are potentially associated with general land use types. Additional information about pollutants of concern is provided within Attachment C.

Potential pollutants identified in Table 2-1 require special consideration if the potential pollutant is also identified as a pollutant causing or contributing to an impairment of beneficial uses of receiving waters. Pollutants requiring special consideration are those on the State's most recently approved 303(d) list. Attachment B, Table B-1 contains a list of 303(d) impaired water bodies and the pollutants attributed to these impairments.



**Table 2-1  
Land Use Types and Associated Pollutants of Concern**

	Residential Development (> 10 Units)	Commercial/ Industrial Development (> 100,000 ft <sup>2</sup> )	Automotive Repair Shops	Restaurants (> 5,000 ft <sup>2</sup> )	Hillside Development (>10,000 ft <sup>2</sup> )	Developments That Directly Discharge Into A Sensitive Area (>2,500 ft <sup>2</sup> )	Parking Lots (> 5,00ft <sup>2</sup> )
Sediments	P	P <sup>1</sup>			P	P	P <sup>1</sup>
Nutrients	P	P <sup>1</sup>			P	P	P <sup>1</sup>
Trash	P	P	P	P	P	P	P
Metals		P	P				P
Bacteria	P	P <sup>2</sup>		P		P	P <sup>5</sup>
Oil and Grease	P	P	P	P	P	P	P
Organics		P <sup>4</sup>	P <sup>3, 4</sup>			P	P <sup>3</sup>
Notes: Significant Redevelopment can be any one of the land use types listed above  <b>P</b> = Potential source <sup>1</sup> If landscaping or open area exists on-site. <sup>2</sup> If land use involves food or animal waste products. <sup>3</sup> Including petroleum hydrocarbons. <sup>4</sup> Includes solvents. <sup>5</sup> Analyses of pavement runoff routinely exhibit bacterial indicators.							

## 2.2.2 Identify Hydrologic Conditions of Concern

Common changes to the hydrologic regime resulting from development include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; and faster time to reach peak flow. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding a downstream channel. These changes have the potential to impact downstream channels and habitat integrity.

A change to a hydrologic regime would be considered a condition of concern if the change would have a significant impact on downstream natural channels and habitat integrity, alone or in conjunction with impacts of other projects. For the purposes of WQMP development and approval, a hydrologic condition of concern does not exist if a project meets Criterion 1 AND either Criterion A or Criterion B shown below:

**Criterion 1:** A WQMP will be developed and implemented in full accordance with this guidance for WQMP development, including but not limited to provisions for site design, source control BMPs, and/or structural treatment control BMPs to minimize pollutants of concern in stormwater discharges from the project site.

**Criterion A:** Runoff from the project is discharged to an improved reach of a municipal separate storm sewer system (MS4) covered by the Permit and the discharge is in full compliance with Agency requirements for connections and discharges to the MS4, including both quality and quantity requirements, and is permitted by the Agency for the connection or discharge to the MS4.

**Criterion B:** Runoff from the project site is discharged in complete accordance with a locally approved and adopted Master Plan of Drainage and Water Quality, including both quality and quantity requirements, with such plan having been approved by the Agency on or after April 26, 2002.

For projects meeting Criterion 1 and either Criterion A or Criterion B, the WQMP shall clearly set forth in the WQMP how the criteria are met. For all other projects, the WQMP shall supply sufficient information to demonstrate to the Agency that the project will not adversely impact the hydrologic regime. Project applicants must review watershed plans, drainage area master plans, or other planning documents to the extent available, to identify BMP requirements for new development and redevelopment that address cumulative impacts from development in the watershed.

## 2.3 Best Management Practices

A WQMP must describe water quality controls, commonly referred to as Best Management Practices (BMPs), which will be implemented for a project. The BMPs shall be incorporated into the project to minimize the impact from identified pollutants of concern and hydrologic conditions of concern. Where pollutants of concern include pollutants that are listed as causing or contributing to impairments of receiving waters, BMPs must also be selected so that the project does not cause or contribute to an exceedance of receiving water quality objectives.

Strategies to minimize the pollutants in runoff from the project site include site design BMPs, source control BMPs, and/or treatment control BMPs.

*Site design BMPs* aim to incorporate site features such as vegetation to reduce and control post-development runoff rates. Because site design reduces runoff, it minimizes the transport mechanism for moving pollutants off site, it helps mitigate the differences between pre- and post-development hydrographs thereby reducing changes in flow regime, and it minimizes the size of necessary structural control BMPs to treat runoff prior to discharge from the site or at regional facilities. Therefore, site design is usually the most efficient and cost effective way to minimize impacts. All projects shall include site design BMPs. Table 2-2 lists examples of site design BMPs.

*Source control BMPs* reduce the potential for stormwater runoff and pollutants from coming into contact with one another. Source control BMPs are defined as any administrative action, design of a structural facility, usage of alternative materials, and operation, maintenance, inspection, and compliance of an area that aims to eliminate or reduce stormwater pollution. Each new development and significant redevelopment project is required to implement appropriate Source Control BMP(s). Table 2-2 lists examples of source control BMPs.

*Treatment control BMPs* are defined as any engineered system designed and constructed to treat the adverse impacts of stormwater and urban runoff pollution. These BMPs may remove pollutants by filtration, media absorption, or other physical, biological, or chemical process. Table 2-3 lists examples of treatment control BMPs.

*Site design BMPs, source control BMPs, and treatment control BMPs* are most effective when used in conjunction with one another to protect water quality. Site design and source control BMPs may be implemented to a level that significantly reduces the size or extent to which treatment control BMPs need to be implemented.

Treatment control BMPs may be eliminated, in some cases, if site design BMPs and source control BMPs are demonstrated to effectively eliminate pollutant discharges. Upon presentation of a WQMP with sufficient site design and source controls to fully meet the WQMP objectives shown in Section 1.1, and upon specific written request by the developer, the Agency may approve the WQMP without the addition of treatment control BMPs. The developer is fully responsible for the presentation of evidence, including but not limited to monitoring data and special studies, to support the attainment of the WQMP objectives through site design and source control BMPs only.

Additional BMP reference material is contained within the California Stormwater Quality Association's, "Stormwater Best Management Practices Handbook for New Development and Redevelopment" and the "Stormwater Best Management Practices Handbook for Industrial and Commercial" (CASQA, 2003). The most recent editions of the CASQA handbooks are acceptable for use in the development of BMPs for inclusion in the WQMP. The most recent editions of the CASQA handbooks can be downloaded at [www.cabmphandbooks.com](http://www.cabmphandbooks.com), and supercede references in the Permit to the 1993 handbooks published by the Stormwater Quality Task Force (the predecessor of CASQA).

<b>Table 2-2</b> <b>Required Site Design and Source Control BMPs *</b>	
<b>Administrative</b>	Education of Property Owners
	Activity Restrictions
	Spill Contingency Plan
	Employee Training/Education Program
<b>Design</b>	Landscape Planning (SD-10)
	Roof Runoff Controls (SD-11)
	Efficient Irrigation (SD-12)
	Storm Drain Signage (SD-13)
	Inlet Trash Racks
	Air/Water Supply Area Drainage
	Energy Dissipators
<b>Alternate Material</b>	Pervious Pavement (SD-20)
	Alternative Building Materials (SD-21)
<b>Area and Activity Control</b>	Fueling Areas (SD-30)
	Maintenance Bays and Docks (SD-31)
	Trash Storage Areas (SD-32) and Litter Control
	Vehicle Washing Areas (SD-33)
	Outdoor Material Storage Areas (SD-34)
	Outdoor Work Areas (SD-35)
	Outdoor Processing Areas (SD-36)
	Street Sweeping Private Street and Parking Lots
	Wash Water Controls for Food Preparation Areas
<b>Inspection and Compliance</b>	Common Areas Catch Basin Inspection
* Any BMP including reference such as (SD-30) is included in the California Stormwater Quality Association, Stormwater Best Management Practices Handbook for New Development and Redevelopment (CASQA, January 2003).	

<b>Table 2-3</b> <b>Design Basis of Treatment Control BMPs</b>	
<b>Treatment Control BMP</b>	<b>Design Basis</b>
Vegetated Buffer Strips (TC-31)	Flow Based
Vegetated Swale (TC-30)	
Multiple Systems (TC-60)	
Bioretention (TC-32)	Volume Based
Wet Pond (TC-20)	
Constructed Wetland (TC-21)	
Extended Detention Basin (TC-22)	
Water Quality Inlet (TC-50)	
Retention/Irrigation (TC-12)	
Infiltration Basin (TC-11)	
Infiltration Trench (TC-10)	
Media Filter (TC-40)	

### 2.3.1 Site Design and Source Control BMPs

Site design and source control BMPs may be subcategorized as follows; Administrative, Design, Materials, Areas, and Inspection and Compliance. These subcategories are further broken down into explicit controls. Table 2-2 lists the BMPs and references the BMP ID number used in the 2003 CASQA Handbook.

The following site design and source control BMPs must be implemented for all projects. Planned implementation details must be described within the WQMP. Where a required source control BMP is infeasible, justification and/or alternative practices for eliminating or reducing pollutants must be provided.

#### **Administrative BMPs**

##### *Education for Property Owners, Tenants, and Occupants*

For developments with no Property Owners Association (POA)<sup>1</sup> or POAs of less than fifty (50) dwelling units, practical information materials will be provided to the first residents/occupants/tenants. These materials shall include general good housekeeping practices that contribute to protection of stormwater quality, and BMPs that eliminate or reduce pollution during property improvements (concrete work, pool installation, etc). These materials will be made available by the Agency, and nominal fees to recover the cost of printing may be required by the Agency. The developer shall request these materials in writing at least 30 days prior to intended distribution and shall then be responsible for their timely distribution at the time of occupancy.

For developments with POA or residential projects of more than fifty (50) dwelling units, project conditions of approval will require that the POA provide environmental awareness education materials. These materials must contain the information required for developments of less than fifty (50) dwellings, plus describe the use of chemicals (including household type) that should be limited to the property, with no discharge of specified wastes via hosing or other direct discharge to gutters, catch basins, and storm drains. These materials will be made available by the Agency, and nominal fees to recover the cost of printing may be required by the Agency. The developer shall request these materials in writing at least 30 days prior to intended distribution and shall then be responsible for their timely distribution at the time of occupancy.

##### *Activity Restrictions*

If a POA is formed, conditions, covenants, and restrictions shall be required for the purpose of water quality protection. Alternatively, use restrictions may be developed by a building operator through lease terms, or other mechanisms. Pesticide application in common areas must be performed by an applicator certified by the California Department of Food and Agriculture.

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<sup>1</sup> The term "Property Owners' Association" or POA, as used herein, means a nonprofit corporation or unincorporated association created for the purpose of managing a common interest development [from California Civil Code Sec. 1351 (a)].

### ***Spill Contingency Plan***

A “Spill Contingency Plan” (Business Emergency/Contingency Plan Guidelines and Forms) shall be provided in accordance with Section 6.95 of the California Health and Safety Code.

### ***Employee Training/Education Program***

For developments where people will be employed to perform activities that may impact water quality, BMP training and education programs must be provided. Materials based upon information provided through the Area-wide Stormwater Program Public Education Program may be used. Training and education program commitments may be conveyed, for development that is constructed for an unspecified use, to a POA or development purchaser.

### **Design BMPs**

#### ***Landscape Planning***

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels. Plants should be grouped with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Ongoing maintenance consistent with County Administrative Design Guidelines or local equivalent, plus fertilizer and pesticide usage consistent with the instructions contained on product labels and with the regulations administered by the State Department of Pesticide Regulations shall be implemented.

#### ***Roof Runoff Controls***

Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas.

#### ***Efficient Irrigation***

Irrigation methods should be utilized to minimize runoff of excess irrigation water across impervious surfaces and into the stormwater conveyance system. Such measures include employing rain-triggered shutoff devices to eliminate or reduce irrigation during and immediately after precipitation, using mulches (such as wood chips) to minimize sediment in runoff and to maintain soil infiltration capacity, and coordinating design of the irrigation system and landscape to minimize overspray and runoff.

#### ***Storm Drain Signage***

Signage such as notices regarding discharge prohibitions at storm drain inlets to eliminate or reduce dumping and littering are required. The phrase “No Dumping – Flows to Creek,” or an equally effective phrase as approved by the NPDES General Committee, must be stenciled on catch basins (inlets) to alert the public as to the destination of pollutants discharged into storm drains.

### ***Inlet Trash Racks***

Where appropriate to reduce intake and transport through the storm drain system of large floatable debris, trash racks shall be provided where drainage from open areas enters storm drains.

### ***Energy Dissipator***

Energy dissipators such as riprap must be installed at the outlets of new storm drains that enter unlined channels in accordance with applicable Agency specifications.

## **Alternate Material BMPs**

### ***Pervious Pavement***

A pervious (porous) surface such as grass, modular pavers, or porous asphalt or concrete, must be used where appropriate (light vehicle loading areas) to reduce runoff.

### ***Alternative Building Materials***

Materials used to reduce potential sources of pollutants in stormwater runoff by eliminating compounds that can leach into runoff and reducing the need for pesticides, paints, and other materials are encouraged to be used.

## **Areas and Activity Control BMPs**

### ***Fueling Areas***

Areas used for fuel dispensing shall be paved with Portland cement concrete (or; equivalent smooth, impervious surface) with a 2% to 4% slope to eliminate or reduce ponding, and must be separated from the rest of the site by a grade break that eliminates or reduces run-on of stormwater. Concrete surfacing must extend a minimum of 6.5 feet from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus one foot, whichever is less. The fuel dispensing area shall be graded and constructed as to eliminate or reduce stormwater flow through the concrete fueling area. Spilled material within the fuel dispensing area must be prohibited from draining to the street or storm drain system. Spills must be immediately cleaned up in accordance with a Spill Contingency Plan.

All fuel dispensing areas are to have a canopy structure, and the canopy's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area, as defined above. Canopy roof downspouts are to be routed to eliminate or reduce drainage across the concrete fueling area.

### ***Air/Water Supply Area Drainage***

Areas used for air/water supply must be graded and constructed so as to contain spilled material for cleanup.

### ***Maintenance Bays and Docks***

Loading docks must be kept in a clean and orderly condition through a regular program of sweeping, litter control, and immediate cleanup of spills and broken containers. Polluted material or wash waters shall not be allowed to discharge into a storm drain.

Loading dock areas should be covered, or drainage should be designed to preclude urban run-on and runoff. Direct connections into storm drains from depressed loading docks (truck wells) are prohibited. Below-grade loading docks from grocery stores and warehouse/distribution centers of fresh food items should drain through water quality inlets, or to an engineered infiltration system, or an equally effective alternative.

### ***Trash Storage Areas and Litter Control***

Trash container (dumpster) areas shall have drainage from adjoining roofs and pavements diverted around the area(s). Dumpsters shall be leak proof and have attached workable covers. For trash container areas associated with fuel dispensing, vehicle repair/maintenance, and industry, grade and pave the area to eliminate or reduce run-on of storm water to the maximum extent practicable. Trash compactors shall be roofed and set on a concrete pad. The pad shall be a minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line.

For developments with POAs, the POA must be required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of stormwater. The POAs may contract with their landscape maintenance firms to provide this service during regularly scheduled maintenance, which should consist of litter patrol, proper disposal of pet litter, emptying of trash receptacles in common areas, and noting trash disposal violations by homeowners or businesses and reporting the violations to the Association.

### ***Vehicle Washing Areas***

In multi-family developments where car washing or rinsing is not specifically prohibited via CC&Rs or other acceptable means, and in developments having a common parking area where car washing or rinsing is not specifically prohibited via CC&Rs or other acceptable means, a designated car washing and rinsing area that does not drain directly to a storm drain shall be provided for common usage. Wash and rinse waters from this area must either be directed to the sanitary sewer (with prior approval of the sewer agency), to an engineered filtration system, or an equally effective alternative.

For business where washing or rinsing of vehicles or equipment without steam cleaning occurs, provide wash racks connected to the sewer in accordance with agency guidelines and with the prior approval of the sewer agency (Note: discharge monitoring may be required by the sewer agency). Surface runoff and roof drains shall be directed away from these wash racks. Where steam cleaning



occurs, provide wash racks and/or structurally contain (with a cover to restrict the entry of stormwater during rain events) runoff from such areas onsite for commercial waste removal.

#### ***Outdoor Material Storage Areas***

Where plans propose outdoor storage containers for oils, fuels, solvents, coolants, wastes, and other chemicals, the areas where these materials are to be used or stored must be protected by secondary containment structures such as a low containment berm, dike, or curb, designed to the satisfaction of the approving Agency. For commercial outdoor vehicle and equipment salvage yards, and commercial outdoor recycling facilities, the entire facility must comply with the NPDES General Industrial Activities Storm Water Permit. Piles of materials or products that are stored outside and that have the potential to cause pollutant discharges shall be protected from rainfall, runoff, run-on, and wind erosion.

#### ***Outdoor Work Areas***

Where vehicle or equipment repair/maintenance occurs, impermeable berms, trench drains, or containment structures shall be provided around repair bays to eliminate or reduce spilled materials and wash-down waters from entering the storm drain system. Surface runoff or roof drains shall be directed away from these spill containment structures. Sidewalls and canopies may be used to meet this requirement.

#### ***Outdoor Processing Areas***

Where wet material processing occurs (e.g., electroplating), secondary containment structures shall be provided to hold spills resulting from accidents, leaking tanks or equipment, or any other releases (Note: If these are plumbed to the sanitary sewer, the structures and plumbing shall be in accordance with State and local spill containment and reporting requirements and have the prior approval of the sewerage agency).

#### ***Street Sweeping Private Streets and Parking Lots***

For developments with POAs and privately owned streets and parking lots, the streets and parking lots must be swept at least annually to reduce the amount of sediment, garden waste, and trash from entering the storm drain systems.

#### ***Wash Water Controls for Food Preparation Areas***

Food establishments (per State Health and Safety Code 27520) shall have contained areas, floor sink(s) and/or mop sink(s) with sanitary sewer connections for cleaning of kitchen floor mats and for disposal of wash waters containing kitchen and food wastes. The contained area shall also be covered to eliminate or reduce entry of stormwater.

## **Inspection and Compliance BMPs**

### ***Common Area Catch Basin Inspection***

Catch basins must be inspected annually and cleaned if accumulated sediment/debris fills 25% or more of the sediment/debris storage capacity of the facility.

## **2.3.2 Site Design BMPs**

Projects for which hydrologic conditions of concern have been identified shall control post-development peak stormwater runoff discharge rates and velocities to protect stream habitat and to prevent downstream erosion and sedimentation. Projects can address these objectives by the incorporation of appropriate site design BMPs intended to create a project design that mimics the predevelopment hydrologic regime. Mimicking a site's predevelopment hydrologic regime may be achieved in all or part by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the municipal storm drain system, and minimizing clearing and grading.
- Providing runoff storage measures dispersed strategically throughout a site, often accomplished by incorporating a variety of detention and retention facilities into the site's landscaped areas.
- Implementing on-site hydrological functional landscape design and management practices.

These same practices, because they reduce the volume and usually the rate of runoff, also have the benefit of reducing the amount of stormwater that must be treated before being discharged or to be treated in regional facilities.

### **2.3.2.1 Minimize Stormwater Runoff, Minimize Project's Impervious Footprint, and Conserve Natural Areas**

A design can minimize and/or control differences between the pre- and post development site hydrographs by utilizing measures that reduce runoff rates and volumes, and increase infiltration. A reduction in stormwater runoff from a development project using properly designed BMPs can yield a corresponding reduction in the amount of pollutants transported from a site. The undeveloped runoff volume should be determined by considering the project site to be in a natural condition with surface vegetation in place.

The following design options shall be considered and incorporated where applicable and feasible during the site planning and approval process consistent with any applicable General Plan policies, other development standards and regulations, and with any site design BMPs included in an applicable regional or watershed program.

- Maximize the permeable area. This can be achieved in various ways, including but not limited to, increasing building density (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces. Decreasing the project's footprint can substantially reduce the project's impacts to water quality and hydrologic conditions, provided that the undeveloped area remains pervious open space.
- Conserve natural areas. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. Where available, the developer shall refer to biological reports and regulations, as appropriate, to assist in determining sensitive portions of a site. Sensitive areas include, but are not limited to areas necessary to maintain the viability of wildlife corridors, habitat of sensitive species, and wetlands.
- Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets, and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.
- Construct streets, sidewalks, and parking lot aisles to the minimum widths necessary, provided that public safety and a pedestrian friendly environment are not compromised<sup>2</sup>. Incorporate landscaped buffer areas between sidewalks and streets.
- Reduce widths of street where off-street parking is available<sup>3</sup>.
- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
- Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
- Use natural drainage systems.
- Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration<sup>4</sup>.

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<sup>2</sup> Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements.

<sup>3</sup> However, street widths must still comply with life safety requirements for fire and emergency vehicle access.

<sup>4</sup> However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff. Infiltration areas may be subject to regulation as Class V injection wells and may require a report to the USEPA. Consult the Agency for more information on use of this type of facility.

- Construct onsite ponding areas or retention facilities to increase opportunities for infiltration, while being cognizant of the need to prevent the development of vector breeding areas.
- Other comparable site design options that are equally effective.

#### **2.3.2.2 Minimize Directly Connected Impervious Areas**

WQMPs shall incorporate the following design characteristics, as appropriate, and incorporate any site design BMPs included in any regional or watershed program that the project relies upon for Treatment Control BMPs.

- Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.
- Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.
- Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.
- Use one or more of the following:
  - Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings
  - Urban curb/swale system; street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.
  - Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to municipal storm drain systems.
  - Other comparable design concepts that are equally effective.
- Use one or more of the following features for design of driveways and private residential parking areas:
  - Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the municipal storm drain system.
  - Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface; or designed to drain into landscaping prior to discharging to the municipal storm drain system.
  - Other comparable design concepts that are equally effective.

- Use one or more of the following design concepts for the design of parking areas:
  - Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.
  - Overflow parking (parking stalls provided in excess of the Agency's minimum parking requirements) may be constructed with permeable paving.
  - Other comparable design concepts that are equally effective.

### **2.3.3 Treatment Control BMPs**

Where required, treatment control BMPs must be selected with respect to identified pollutants of concern. Treatment control BMPs must be designed to treat the stormwater quality flow or the stormwater quality volume from a development. Treatment control BMPs may also be provided offsite or through a regional-based BMP.

Table B-2 in Attachment B summarizes expected performance of treatment control BMPs in removing various pollutants of concern. For more specific information on the pollutant removal capabilities of various BMPs, refer to the California Stormwater Quality Association's, "Stormwater Best Management Practices Handbook for New Development and Redevelopment" (CASQA, 2003). Table 2-3 lists treatment control BMPs and the primary design basis (flow-based or volume-based) to be used for designing BMPs. Sections 2.3.3.1 and 2.3.3.2 provide detailed guidance for determining the flow or volume of runoff from a project to be treated via treatment control BMPs.

The obligation to install treatment control BMPs at new development and redevelopment sites is met if, for a common scheme of development, BMPs are constructed with the requisite capacity to serve the entire common scheme, even if certain phases of the common scheme may not have BMP capacity located on that phase. BMP capacity must be functional before any phased work begins, thus may not be added on at the end of phased development.

If the treatment control BMP selected for the project functions by infiltration, the BMP shall not violate the requirements set forth in 40 CFR 144 for Class V Injection Wells or any potential local infiltration requirements. In addition, treatment control BMPs that allow infiltration shall not cause or contribute to an exceedance of groundwater quality objectives, shall not be used in industrial or high vehicular traffic areas (25,000 or greater average daily traffic), must be located at least 100 feet horizontally from any water supply well, must be at least 10 feet vertically above the historic high groundwater mark, and shall not cause a nuisance or pollution as defined in Water Code Section 13050.

## **Flow Based Treatment Control BMPs**

### ***Vegetated Buffer Strips***

Vegetated buffer strips require frequent landscape maintenance. Maintenance requirements typically include grass or shrub-growing activities such as irrigation, mowing, trimming, removal of invasive species, and replanting when necessary. Consider use of duplicate facilities such that one one-half of the facility can be taken out of service to allow for maintenance without reducing the required level of treatment performance. This is especially helpful for vegetated buffer strips that need to be dry before they can be mowed.

### ***Vegetated Swales***

Vegetated swales require a thick vegetative cover to function properly. Vegetative swales usually require normal landscape maintenance activities such as irrigation and mowing to maintain pollutant removal efficiency. The application of fertilizers and pesticides should be minimized. Consider use of duplicate facilities such that one one-half of the facility can be taken out of service to allow for maintenance without reducing the required level of treatment performance. This is especially helpful for vegetated swales that need to be dry before they can be mowed.

### ***Multiple Systems***

Multiple systems require separate treatment processes for each of the BMPs.

### ***Bioretentions***

Bioretentions require frequent landscape maintenance, including measures to ensure that the area is functioning properly, as well as maintenance of the landscaping on the practice.

## **Volume Based Treatment Control BMPs**

### ***Wet Ponds***

Wet ponds require the removal of sediment occasionally and adequate resources must be committed to properly maintain peripheral aquatic vegetation, control vector production, and maintain effective pool volume, in order to maintain the pond's design capacity. A proactive and routine preventative maintenance plan is crucial to minimizing vector habitat. A vegetated buffer should be preserved around the pond to protect the banks from erosion and provide some pollutant removal before runoff enters the pond by overland flow.

### ***Constructed Wetlands***

Constructed wetlands require a continuous base flow to maintain aquatic plants. Salts and scum can accumulate in wetlands and, unless properly designed and managed, can be flushed out during larger storms. Wetlands can become a breeding area for mosquitoes and midges unless carefully designed and maintained. A proactive and routine preventative maintenance plan is crucial to minimizing vector habitat.

### ***Extended Detention Basin***

Extended detention basins require inspection semi-annually and after significant storm events to identify potential problems early. Most maintenance efforts will need to be directed toward vegetation management and vector control, which may focus on basic housekeeping practices such as removal of debris accumulations and vegetation management to ensure that the basin dewateres completely, within 72 hours, to prevent creating vector habitats.

### ***Water Quality Inlet***

Water quality inlet (WQI) maintenance is site-specific due to variations in sediment and hydrocarbon by-products which may require disposal as hazardous waste. Establishment of a maintenance schedule is helpful for ensuring proper maintenance, because the WQIs are underground and can easily be neglected. High sediment loads can interfere with the ability of the WQI to effectively separate oil and grease from the runoff.

### ***Retention/Irrigation***

Retention/irrigation requires frequent inspection and maintenance to verify proper operation of these facilities. Pollutant removal rates are estimated to be nearly 100% for all pollutants in the captured and irrigated stormwater volume

### ***Infiltration Basin***

Infiltration basins perform better in well-drained permeable soils. Infiltration basins in areas of low permeability can clog within a couple of years, and require more frequent inspection and maintenance. The use and regular maintenance of pretreatment BMPs will significantly minimize maintenance requirements for the basin. Spill response procedures and controls should be implemented to prevent spills from reaching the infiltration basin.

Particular care is required in new developments where the area upstream of the infiltration BMP may not be fully stabilized, or in existing developments where upstream areas may become destabilized due to construction work, lack of maintenance, fire, or other actions. In these cases, measures to prevent sediment from entering and clogging the BMP are necessary until the drainage area is stabilized.

This BMP may require groundwater monitoring. Basins should not be put into operation until the upstream tributary area is stabilized.

### ***Infiltration Trench***

Infiltration trenches require an effective pretreatment, such as vegetated buffer strips, to remove sediment and minimize clogging. If the trench clogs, it may be necessary to remove and replace all or part of the filter fabric and possibly the coarse aggregate. Maintenance should be concentrated on the pretreatment practices, such as buffer strips and swales upstream of the trench to ensure that sediment does not reach the infiltration trench.

Particular care is required in new developments where the area upstream of the infiltration BMP may not be fully stabilized, or in existing developments where upstream areas may become destabilized due to construction work, lack of maintenance, fire, or other actions. In these cases, measures to prevent sediment from entering and clogging the BMP are necessary until the drainage area is stabilized.

Regular inspection should determine if the sediment removal structures require routine maintenance. Infiltration basins should not be put into operation until the upstream tributary area is stabilized.

### ***Media Filter***

Media filters clog easily when subjected to heavy sediment loads. Sediment reducing pretreatment practices, such as vegetated buffer strips or vegetated swales, placed upstream of the filter should be maintained properly to reduce sediment loads into the filter. Media filters should drain within 72 hours to minimize vector habitat. Maintenance will need to focus on basic housekeeping practices such as removal of debris accumulations and vegetation management (within media filter) to prevent clogs and/ or standing water. Materials such as sand, gravel, filter cloth, or filter media must be disposed of properly and in accordance with all applicable laws.

### **2.3.3.1 Flow-Based Design**

Flow-based BMP design standards apply to BMPs whose primary mode of pollutant removal depends on the rate of flow of runoff through the BMP.

#### ***Determining Flow Treatment Requirements***

The following steps describe the approach for application of the flow-based BMP design criteria:

- **Identify the drainage area** that drains to the proposed BMP. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, impervious areas, and runoff from off-site areas that commingle with site runoff, whether or not they are directly or indirectly connected to the BMP. Calculate this area in units of acres.
- **Determine rainfall intensity criteria** using the 'Cumulative Frequency Hourly Rainfall Intensity' Curve in Attachment D. Use the rainfall intensity corresponding to the cumulative probability specified in the Permit (85%). Using the curve, determine the rainfall intensity corresponding to the 85% percentile. Multiply the intensity by the safety factor specified in the criteria, usually 2, to calculate the "Design Rainfall Intensity."
- **Calculate the composite runoff coefficient "C-Factor"** for the BMP Drainage Area. Obtain individual C-Factors from the local agency or from the local flood control district; if C-Factors are not available locally, obtain factors from hydrology text books or estimate using Table B-3 in Attachment B. Composite the individual C-Factors using area-weighted averages.



- **Calculate the BMP design flow** by using the Rational Formula ( $Q = CiA$ ). Using the BMP Drainage Area, the Design Rainfall Intensity, and the composite runoff coefficient (C-Factor), apply the Rational Formula. The result is the BMP Design Flow.

$Q =$   $CiA$ , where:

$Q =$  BMP Design Flow (ft<sup>3</sup>/s)

$i =$  Rainfall Intensity (in/hr)

$A =$  BMP Drainage Area (Acres)

$C =$  C-Factor (runoff coefficient)

### 2.3.3.2 Volume-Based Design

Volume-based BMP design standards apply to BMPs whose primary mode of pollutant removal depends on the volumetric capacity of the BMP. Volume-based Treatment Control BMPs shall be designed to infiltrate or treat the design volume of runoff.

#### *Determining Volume Treatment Requirements*

Use the following steps to design a volumetric-based stormwater quality BMP:

- **Determine the BMP Drainage Area** that drains to the proposed BMP. This includes all areas that will contribute runoff to the proposed BMP, including pervious areas, and runoff from off-site areas that commingle with site runoff, whether or not they are directly or indirectly connected to the BMP. Calculate this area in acres.
- **Calculate the composite runoff coefficient "C-Factor"** for the BMP Drainage Area. Obtain individual C-Factors from the local agency or from the local flood control district: if C-Factors are not available locally, obtain factors from hydrology text books or estimate using Table B-3 in Attachment B. Composite the individual C-Factors using area-weighted averages.
- **Determine the applicable requirement for capture of runoff.** For San Bernardino County design to capture 80% of runoff.
- **Determine the Unit Basin Storage Volume** by using the 'Capture/Treatment Analysis' Curves in Attachment D corresponding to the desired drain down time. Curves are presented for 24 hour and 48 hour draw down times. The 48 hour curve should be used in most areas of California. Draw down times in excess of 48 hours should be used with caution as vector breeding can be a problem after water has stood in excess of 72 hours. (Use of the 24 hour curve should be limited to drainage areas with coarse soils that readily settle and to watersheds where warming may be detrimental to downstream fisheries.) Enter the capture curve on the vertical axis

at the 80% capture value. Move horizontally to the right across capture curve until the curve corresponding to the drainage area's composite runoff coefficient "C-Factor" determined is intercepted. Interpolation between curves may be necessary. Move vertically down from the point of interception to the horizontal axis. Read the Unit Basin Storage Volume on the horizontal axis.

- **Calculate the required capture volume of the BMP** by multiplying the BMP Drainage Area by the Unit Basin Storage Volume to give the BMP volume. Due to the mixed units that result (e.g., ac-in., ac-ft) it is recommended that the resulting volume be converted to cubic feet for use during design.

### 2.3.4 Equivalent Treatment Control Alternatives

Where on-site treatment control BMPs are determined to be infeasible or impracticable, equivalent treatment may be provided off site when approved by the Agency. Off-site treatment controls must meet the following conditions:

- Treatment control BMPs must be located in the same watershed as the project site.
- Treatment control BMPs must treat a volume and/or flow equal to or greater than the treatment volume and/or flow calculated for the project site using the guidance in this WQMP.
- Treatment control BMPs must treat a pollutant loading equal to or greater than the pollutant loading from the project site.
- Treatment control BMPs must address the pollutants of concern and hydrologic conditions of concern for the project site.
- Treatment control BMPs located off-site must be operational prior to the construction phase of the new development or redevelopment project.
- Site design BMPs and source control BMPs must continue to be implemented at the project site in accordance with this WQMP.

Subject to approval by the Agency, off-site treatment control BMPs with excess capacity may be used to meet the treatment needs of additional projects as long as each project meets the requirements of this section and such that the requirements are met when the projects are combined. For example, if the treatment volume for Project 1 is  $V=A$  and the treatment volume for Project 2 is  $V=B$ , then an off-site treatment control BMP would need to have a treatment volume capacity of at least  $V=A+B$  in order to treat the runoff from both Project 1 and Project 2. Similar provisions apply for flows and pollutants.

The provisions in this Section are supplemental to the provisions in Section 3 for regionally-based water quality control programs. While similar in nature, the provisions in Section 2.3.4 are intended to be implemented primarily on a smaller, more local basis. For example, a single developer of separate but adjacent projects might utilize the provisions of this section to propose that controls for both projects be located on one of the two separate sites, or possibly even propose that the controls for both sites be located on a third site.

## **2.4 Operations and Maintenance**

Operation and maintenance (O&M) requirements for all source control and treatment control BMPs shall be identified in the WQMP. The WQMP shall include the following:

- Identification of each BMP that requires O&M.
- Thorough description of O&M activities, the O&M process, and the handling and placement of any wastes.
- BMP start-up dates.
- Schedule of the frequency of O&M for each BMP.
- Identification of the responsible parties for O&M, including a written agreement with the entities responsible for O&M.
- Self-inspections and record-keeping requirements for BMPs (review local specific requirements regarding self-inspections and/or annual reporting), including identification of responsible parties for inspection and record- keeping.
- Thorough descriptions of water quality monitoring (if locally required).
- Signed statement (with date) accepting responsibility for maintenance, repair, replacement, and inspection of BMPs. O&M requirements must be transferred to future site owners as described in Section 4.2.
- Local jurisdictions should have authority to maintain the BMP, if necessary, and invoice the owner for costs.

## **2.5 Funding**

A funding source or sources for the O&M of each BMP identified in the WQMP must be identified. By certifying the WQMP (see Section 2.1), the applicant is certifying that the funding responsibilities have been addressed and will be transferred to future site owners. An example of how to adhere to the requirement to transfer O&M responsibilities might be to record the WQMP against the title to the property.

## Section 3

# Regional-Based Water Quality Control

For watersheds, sub-watershed, drainage areas, and other areas covered by a comprehensive master plan of drainage and water quality control approved by the Agency since April 26, 2002, regionally-based treatment control BMPs are an alternative approach to on-site treatment control BMP implementation. Regionally-based BMPs may provide a more effective and cost efficient runoff treatment control mechanism for multiple new development and redevelopment projects within the area covered by the comprehensive master plan of drainage and water quality. When regionally-based BMPs are utilized, the development and redevelopment project must continue to implement site design and source control BMPs. Regionally-based treatment control BMPs can treat stormwater from several source areas at a single or multiple downstream location(s). This approach can be effective when limited space is available for structural BMPs in development and redevelopment areas.

Regionally-based treatment control BMPs will be considered for acceptance by the Agency as an alternative to on-site measures if the project applicant demonstrates the following:

- There is adequate capacity in the regionally-based treatment control BMP to address the volume-based and flow-based treatment needs of the project.
- The regionally-based treatment control BMP addresses the project's pollutants of concern (after considering site design and source control BMPs that must still be implemented at the project site).
- The applicant identifies the party responsible for the operation, maintenance, and administration of the regionally-based treatment control.
- The applicant has secured rights to participate in the regionally-based BMP solution.
- The applicant has met all of the requirements imposed for participation in the regionally-based BMP, including funding and operation and maintenance requirements, and contingency planning.
- The regionally-based BMP will be on line, operable, and ready to receive flows from the project site prior to issuance of grading permits, building permits, or occupancy permits.
- Site design BMPs and source control BMPs are implemented at the project site.
- Waters of the United States will not be utilized to transport untreated runoff to the regional facility.

Projects participating in regional water quality management programs may rely upon the regional program during the discretionary review process subject to a discussion of how a project will participate in the program. The WQMP must identify its stormwater contribution to the regional program and how it will affect cumulative water quality impacts in the regional watershed. Removal effectiveness, cost, maintenance, and construction timing affect whether a regional-based approach is more appropriate than site-specific approaches.

## **Section 4**

# **Changes in Site Development or Ownership**

### **4.1 Changes in Site Development**

The WQMP must be updated to reflect significant proposed changes in the site's runoff characteristics. Significant changes in the site's runoff characteristics are deemed to potentially occur whenever site work requiring a grading permit is proposed or where exterior work requiring a building permit is proposed. Under these circumstances, the developer shall contact the Agency and provide sufficient information for the Agency to determine whether the existing WQMP is still appropriate: if deemed inappropriate for proposed conditions, the developer shall revise the WQMP to address the cumulative changes to the site and submit the revised WQMP to the Agency for review and approval prior to issuance of permits. Significant changes in the site's runoff characteristics shall be deemed to occur whenever there is a change in use necessitating a conditional use permit (for example, changing from retail to restaurant), or when proposed changes to the site fall into one or more of the project categories that require a WQMP (Table 1-1). Under these conditions, a revised or completely new WQMP shall be developed and submitted for approval in accordance with this guidance document.

### **4.2 Changes in Site Ownership**

For sites with a fully implemented WQMP, the WQMP requirements shall transfer to all future owners of the project site. Recording the WQMP requirements against the title to the property is one way to effectively notify potential buyers and future owners of properties of their responsibilities for the WQMP. New owners have the option to adopt the existing WQMP, to amend the WQMP, or to develop a new WQMP. If the WQMP is amended or if a new WQMP is developed, the amended or new WQMP must be in accordance with this guidance document, must address cumulative changes to the project site, and must be submitted to the Agency for approval.

# **Attachment A**

## **WQMP Template**



# SAN BERNARDINO COUNTY STORMWATER PROGRAM

## **WATER QUALITY MANAGEMENT PLAN TEMPLATE**



# **WATER QUALITY MANAGEMENT PLAN (WQMP)**

For compliance with Santa Ana Regional Water Quality Control Board

Order Number R8-2002-0012 (NPDES Permit No. CAS618036)

**for**

**Project Name**

Prepared for:

**Name of Owner**

**Address for Project Location**

**City, State, Zip for Project Location**

WQMP Preparation Date

**Date**

# WATER QUALITY MANAGEMENT PLAN (WQMP)

## PROJECT SITE INFORMATION

Name of Project: \_\_\_\_\_

Project Location: \_\_\_\_\_

Size of Significant Re-Development on an Already Developed Site (in feet<sup>2</sup>): \_\_\_\_\_

Size of New Development (in feet<sup>2</sup>): \_\_\_\_\_

Number of Home Subdivisions: \_\_\_\_\_

SIC Codes: \_\_\_\_\_

Erosive Soil Conditions?: \_\_\_\_\_

Natural Slope More Than 25%?: \_\_\_\_\_

Indicate type of project by placing an "X" by one of the following:

\_\_\_\_\_ [Industrial/Commercial]

\_\_\_\_\_ [Automotive Repair Shop]

\_\_\_\_\_ [Restaurant]

\_\_\_\_\_ [Hillside Development]

\_\_\_\_\_ [Parking Lot]

\_\_\_\_\_ [Development that discharges to an environmentally sensitive area, area of special biological significance, or 303(d) listed or impaired waterbody]

# WATER QUALITY MANAGEMENT PLAN (WQMP)

Check the appropriate project category below:

**Check  
below**

## **Priority Projects Categories**

	1. All significant re-development projects. Significant re-development is defined as the addition or creation of 5,000 or more square feet of impervious surface on an already developed site. This includes, but is not limited to, additional buildings and/or structures, extension of existing footprint of a building, construction of parking lots, etc. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMPs, the design standards apply only to the addition, and not the entire development. When the redevelopment results in an increase of more than fifty percent of the impervious surfaces, then a WQMP is required for the entire development (new and existing).
	2. Home subdivisions of 10 units or more. This includes single family residences, multi-family residence, condominiums, apartments, etc.
	3. Industrial/commercial developments of 100,000 square feet or more. Commercial developments include non-residential developments such as hospitals, educational institutions, recreational facilities, mini-malls, hotels, office buildings, warehouses, and light industrial facilities.
	4. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532- 7534, 7536-7539).
	5. Restaurants where the land area of development is 5,000 square feet or more.
	6. Hillside developments of 10,000 square feet or more which are located on areas with known erosive soil conditions or where the natural slope is twenty-five percent or more.
	7. Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas such as areas designated in the Ocean Plan as areas of special biological significance or waterbodies listed on the CWA Section 303(d) list of impaired waters.
	8. Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary storage of motor vehicles.
	The project does not fall into any of the eight categories described above.

## **SECTION 1**

### **INTRODUCTION AND PROJECT DESCRIPTION**

#### **1.1 PROJECT INFORMATION**

- Name of project owner.
- Project site address.

#### **1.2 PERMITS**

- List all permit number(s), condition number(s), and any acquired waste discharge identification numbers (WDIDs) pertaining to project.

#### **1.3 PROJECT DESCRIPTION**

- Provide a detailed project description include following:
  - Land-use type (refer to Tables 1-1 and 2-1 in the WQMP Guidance).
  - Project size.
  - Homeowners association or property owner association formation.
- Include location map and site plan identifying storm drain facilities and structures, structural BMPs, stormwater flow (drainage), and the receiving water. The location and site plan may be shown on the same map.

#### **1.4 SITE DESCRIPTION**

- Describe and identify the watershed(s) that the project lies within.
- Include any pre-existing water quality problems that have been identified.

## **SECTION 2**

### **POLLUTANT IDENTIFICATION**

#### **2.1 POLLUTANTS OF CONCERN**

- List all expected pollutants of concern for the project site. Use Table 2-1 in the WQMP Guidance to identify the potential pollutants expected to be generated by the development. Use Table B-1 in the WQMP Guidance to identify any pollutants that contribute to waterbody impairments on the 303(d) list. List any other pollutants of concern from the project site not listed in Tables 2-1 and B-1.

## SECTION 3

### BEST MANAGEMENT PRACTICE SELECTION PROCESS

#### 3.1 STRUCTURAL CONTROL BMPs

- Complete the following selection table for Source Control BMPs. All listed BMPs shall be implemented for the project. Where a required Source Control BMP is infeasible, justification and/or alternative practices for preventing pollutants must be provided. Provide detailed descriptions on the implementation of planned Source Controls.

**Site Design and Source Control BMP Selection Matrix**

Priority Project Category	Source Control BMPs												
	Site Design and Landscape Planning	Roof Runoff Controls	Efficient Irrigation	Storm Drain System Signs	Pervious Pavement	Alternative Building Materials	Fueling Areas	Maintenance Bays and Docks	Trash Enclosures	Vehicle Washing Areas	Outdoor Material Storage Areas	Outdoor Work Areas	Outdoor Processing Areas
Significant Re-development													
Home subdivisions of 10 or more units													
Commercial/ Industrial Development >100,000 ft <sup>2</sup>													
Automotive Repair Shop													
Restaurants													
Hillside Development >10,000 ft <sup>2</sup>													
Development of impervious surface >2,500 ft <sup>2</sup>													
Parking Lots >2,500 ft <sup>2</sup> of exposed storm water													

### **3.2 SITE DESIGN BMPS**

- Provide detailed descriptions on the implementation of planned Site Design BMPs, if applicable.

### **3.3 TREATMENT CONTROL BMPS**

- Complete the following selection table for Treatment Control BMPs. Treatment control BMPs must be selected and installed with respect to identified pollutant characteristics and concentrations that will be discharged from the site. It is the responsibility of the project developer to demonstrate, and document, that all stormwater will receive adequate treatment before it is discharged from the site. The Agency may require information beyond the minimum requirements of this WQMP to demonstrate that adequate pollutant treatment is being accomplished.
- Provide detailed descriptions on the implementation of planned Treatment Control BMPs.

**Treatment Control BMP Selection Matrix**

Priority Project Category	Treatment Control BMPs											
	Infiltration Trench	Infiltration Basin	Retention/Irrigation	Wet Pond	Constructed Wetland	Extended Detention Basin	Vegetated Swale	Vegetated Buffer Strip	Bioretention	Media Filter	Water Quality Inlet	Multiple Systems
Significant Re-development												
Home subdivisions of 10 or more units												
Commercial/Industrial Development >100,000 ft <sup>2</sup>												
Automotive Repair Shop												
Restaurants												
Hillside Development >10,000 ft <sup>2</sup>												
Development of impervious surface >2,500 ft <sup>2</sup>												
Parking Lots >2,500 ft <sup>2</sup> of exposed storm water												

### 3.4 BMP DESIGN CRITERIA

- The following Treatment Control BMP(s) (Flow Based or Volume Based) will be implemented for this project (check "Implemented" box, if used):

#### 3.4.1 FLOW BASED DESIGN CRITERIA

**Design Basis of Treatment Control BMPs**

Implemented	Treatment Control BMP	Design Basis
	Vegetated Buffer Strips	Flow Based
	Vegetated Swale	
	Multiple Systems	
	Bioretention	Volume Based
	Wet Pond	
	Constructed Wetland	
	Extended Detention Basin	
	Water Quality Inlet	
	Retention/Irrigation	
	Infiltration Basin	
	Infiltration Trench	
	Media Filter	

- Calculate the BMP design flow by using the approach presented in the WQMP Guidance. Show calculations in detail.

#### 3.4.2 VOLUME BASED DESIGN CRITERIA

- Calculate the required capture volume of the BMP using the approach presented in the WQMP Guidance. Show calculations in detail.



## **SECTION 4 OPERATION AND MAINTENANCE**

### **4.1 OPERATIONS AND MAINTENANCE**

- Operation and maintenance (O&M) requirements for all Source Control, Site Design, and Treatment Control BMPs shall be identified within the WQMP. The WQMP shall include the following:

#### **4.1.1 O&M DESCRIPTION AND SCHEDULE**

- List and identify each BMP that requires O&M.
- Provide a thorough description of O&M activities (include the O&M process, and the handling and placement of any wastes).
- Include BMP start-up dates.
- Provide schedule of the frequency of O&M for each BMP.

#### **4.1.2 INSPECTION & MONITORING**

- Provide thorough descriptions of water quality monitoring (if locally required)
- Provide self-inspections and record keeping requirements for BMPs (review local specific requirements regarding self-inspections and/or annual reporting), including identification of responsible parties for inspection and record keeping.

#### **4.1. IDENTIFICATION OF RESPONSIBLE PARTIES**

- Provide the party or parties that will be responsible for each BMP O&M.

## **SECTION 5 FUNDING**

### **5.1 FUNDING**

- The Permit requires that for all Treatment Control BMPs, a funding source or sources for operation and maintenance of each BMP be identified within the WQMP.
- Indicate funding sources or sources for O&M for this project.

## SECTION 6 WQMP CERTIFICATION

### 6.1 CERTIFICATION

- The applicant is required to sign and certify that the WQMP is in conformance with Santa Ana Regional Water Quality Control Board Order Number R8-2002-0012 (NPDES Permit No. CAS618036).
- The applicant is required to sign and date the following statement ‘word-for-word’ certifying that the provisions of the WQMP have been accepted by the applicant and that the applicant will have the plan carried out by future successors (transferability statement).

“I certify under a penalty of law that the provisions (implementation, operation, maintenance, and funding) of the WQMP have been accepted and that the plan will be transferred to future successors.”

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Applicant’s Signature

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Date

---

Applicant’s Name

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Applicant’s Telephone Number



# **Attachment B**

## **Tables**

**Table B-1  
303(d) List of Impaired Water Bodies**

Waterbody	Pollutant					
	Bacteria Indicators/ Pathogens	Metals	Nutrients	Organic Enrichment	Sedimentation/Siltation	Suspended Solids
Big Bear Lake		X	X		X	
Canyon Lake (Railroad Canyon Reservoir)	X		X			
Chino Creek Reach 1	X		X			
Chino Creek Reach 2	X					
Cucamonga Creek, Valley Reach	X					
Grout Creek		X	X			
Knickerbocker Creek	X	X				
Lytle Creek	X					
Mill Creek (Prado Area)	X		X			X
Mill Creek Reach 1	X					
Mill Creek Reach 2	X					
Mountain Home Creek	X					
Mountain Home Creek, East Fork	X					
Prado Park Lake	X		X			
Rathbone (Rathbun Creek)			X		X	
Santa Ana River, Reach 3	X					
Santa Ana River, Reach 4	X					
Summit Creek			X			
<b>NOTES:</b>						
1) Summary of the 2002 303(d) Listed Water Bodies and Associated Pollutants of Concern from RWQCB Region 8. Check for updated lists from the RWQCB.						
2) Chlorides, pesticides, salinity, total dissolved solids (TDS), toxicity, and trash are listed impairments within the 303(d) tables, however, they are not impairments in the above waterbodies.						

<b>Table B-2</b> <b>Treatment Control BMP Selection Matrix <sup>1</sup></b>							
	<b>Targeted Constituents</b>						
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil and Grease	Organics
Vegetated Buffer Strip (TC-31)	H	L	M	H	L	H	M
Vegetated Swale (TC-30)	M	L	L	M	L	M	M
Multiple Systems (TC-60)	H	L	H	H	M	H	H
Bioretention (TC-32)	H	M	H	H	H	H	H
Wet Pond (TC-20)	H	M	H	H	H	H	H
Constructed Wetland (TC-21)	H	M	H	H	H	H	H
Extended Detention Basin (TC-22)	M	L	H	M	M	M	M
Water Quality Inlet (TC-50)	L	L	M	L	L	M	L
Retention/Irrigation (TC-12)	H	H	H	H	H	H	H
Infiltration Basin (TC-11)	H	H	H	H	H	H	H
Infiltration Trench (TC-10)	H	H	H	H	H	H	H
Media Filter (TC-40)	H	L	H	H	M	H	H
<b>NOTES:</b> <sup>1</sup> This table is intended to provide general information on pollutant removal. More detailed information on pollutant removal can be obtained from the California Stormwater Quality Association's document, "California Best Management Practices Handbooks – New Development and Redevelopment" (CASQA, 2003). Refer to the web site for the most recent edition: <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> .  L - Low removal effectiveness M - Medium removal effectiveness H - High removal effectiveness							

**Table B-3**  
**C Values Based on Impervious/Pervious Area Ratios**

% Impervious	% Pervious	C
0	100	0.15
5	95	0.19
10	90	0.23
15	85	0.26
20	80	0.30
25	75	0.34
30	70	0.38
35	65	0.41
40	60	0.45
45	55	0.49
50	50	0.53
55	45	0.56
60	40	0.60
65	35	0.64
70	30	0.68
75	25	0.71
80	20	0.75
85	15	0.79
90	10	0.83
95	5	0.86
100	0	0.90

**NOTE:**

Obtain individual runoff coefficient C-Factors from the local agency or from the local flood control district.

If C-Factors are not available locally, obtain factors from hydrology text books or estimate using this table.

Composite the individual C-Factors using area-weighted averages to calculate the Composite C Factor for the area draining to a treatment control BMP.

Do not use the C-Factors in this table for flood control design or related work.

# **Attachment C**

## **Pollutants of Concern**



### ***Pollutants of Concern***

- *Pathogens / Coliforms* – Pathogens and coliforms are ubiquitous microorganisms that can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Animal or human fecal wastes are the primary source of pathogens and coliforms in watersheds.
- *Metals* – Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Human health is threatened by high concentrations of these metals in contaminated groundwater or fish and shellfish. Metals can also be toxic to aquatic life.
- *Nutrients* – Nutrients are inorganic substances, such as nitrogen and phosphorus. Excessive discharge of nutrients to water bodies and streams causes eutrophication, where aquatic plants and algae growth is can lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms. Primary sources of nutrients in urban runoff are fertilizers and eroded soils.
- *Pesticides* – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Relatively low levels of the active component of pesticides can result in conditions of aquatic toxicity.
- *Organic Compounds* – Organic compounds are carbon-based pollutants that can, at certain concentrations, indirectly or directly constitute a hazard to life or health. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons.
- *Sediments* – Sediments are solid materials that are eroded from the land surface. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
- *Trash and Debris* – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Trash impacts water quality by increasing biochemical oxygen demand.
- *Oxygen-Demanding Substances* – These are biodegradable organic materials and chemicals that utilize dissolved oxygen in water. A reduction of dissolved oxygen is detrimental to aquatic life and can generate hazardous compounds such as hydrogen sulfides.

- *Oil and Grease* – Oil and grease in water bodies decreases the aesthetic value of the water body, as well as the water quality. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids.

# **Attachment D**

## **Rain Gauge Data Curves**

Note: Rainfall runoff curves are under development for the San Bernardino County permit area. These curves will be substituted for the curves included herein as they become available. Until these curves become available, the curves herein may be utilized as generally representative of the area in accordance with the handbook, *"California Best Management Practices Handbook – Development and Redevelopment"* (CASQA, 2003).





